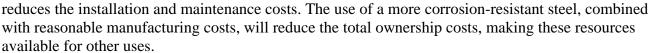


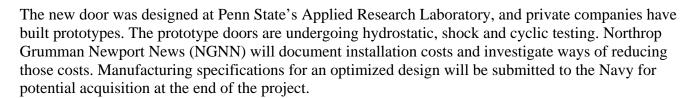
Advanced Surface Ship Watertight Enclosure

A new watertight interior door being evaluated for the Navy supercarrier *USS Gerald R. Ford* (CVN-78) incorporates advances in materials, design, and manufacturing processes. The new doors are 27% lighter than the existing Navy standard watertight doors (NSWDs). The cellular sandwich panels in the new doors are made from corrosion-resistant steel using highly accurate, high-speed, automated laser cutting and welding processes. Novel technologies were used to produce the door seals and latching mechanism, and the plug-in-hole installation process reduces distortion.

NSWDs, designed in the early 1950s, are expensive to install and maintain and are too heavy for today's needs. Installation costs are about \$7,500 per door, and watertight doors require frequent maintenance because of poor functioning, corrosion, and loss of water-tightness.

The new doors have the needed stability, but their reduced weight allows more weight to be allocated to armor, ordinance, cargo, and other warfighting-related functions. Low distortion plug-in-hole installation





On this project, ARL Penn State's Institute for Manufacturing and Sustainment Technologies (iMAST) is teamed with the Naval Surface Warfare Center, Carderock Division, for Navy in-service experience and their expertise in functional and performance requirements of watertight doors, and with NGNN for their expertise in door installation and shipbuilder requirements.

Specifications:

New Door Weight213 poundsPressure capacity15 psiExisting NSWD Weight292 poundsOverload1.5

Dimensions 26 inches x 66 inches New Door Material 304 stainless steel Latches 8 latching dogs NSWD Material A-36 low carbon steel

Window 6 inch diameter

